DOCUMENT RESUME

ED 058 517 AC 012 209

TITLE	An Application of a Systems Approach to Training: A Case Study. Revised Edition.
INSTITUTION	Civil Service Commission, Washington, D.C. Bureau of Training.
REPORT NO	Pamp-T-2
PUB DATE	Jun 69
NOTE	22p.; Training Systems and Technology Series No. II
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 ($.30)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Adult Vocational Education; Case Studies; *Curriculum Development; Federal Programs; Guides; *Instructional Systems; *Job Skills; Law Enforcement; Performance Criteria; Systems Approach; Task Performance; *Training Techniques; Young Adults
IDENTIFIERS	*Federal Law Enforcement Training Center

ABSTRACT

This report is intended to explain the steps followed in developing a particular curriculum, to state the problems encountered and their solutions, and to provide a general guide for others who wish to use a systems approach. The curriculum developed was to be used in training Federal law enforcement recruits. Using a systems approach, job data were collected; task analysis was performed; performance objectives were formulated; and training course outlines were developed. Exhibits A and B present the original and revised Instructional System Design Diagram; Exhibit C is the Task Data Description; Exhibit D is Task Analysis Form for the Curriculum, the Conversion Scale, and Priority Planning Sheet; Exhibit E is the TPO (Terminal Performance Objective) Format; Exhibit F is the Training Outline; Exhibit G is the Selection of Instructional Strategies, Procedure; and Exhibit H is the Guide. A brief bibliography is provided. (DB)

Application of a Systems Approach to Training: A Case Study

Training Systems and Technology Series: No. II

U.S. CIVIL SERVICE COMMISSION
BUREAU OF TRAINING

PAMPHLET T-2

AN APPLICATION OF A SYSTEMS APPROACH TO TRAINING: A CASE STUDY

Revised Edition, JUNE 1969

This study was originally issued as Pamphlet T-2, written by the Bureau of the Budget and the U.S. Civil Service Commission. It was revised in June 1969 and issued as part of the Bureau of Training's Training Systems and Technology series.

U.S. CIVIL SERVICE COMMISSION
Bureau of Training

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 30 cents

TABLE OF CONTENTS

I. INTRODUCTION

In September 1967 a recommendation by the Bureau of the Budget led to the development of a proposal for a Consolidated Federal Law Enforcement Training Center. A planning and research group was established under the supervision of an interagency steering committee to develop the proposal for consideration by the participating agencies. The proposal provided for a cooperative center in which about 20 small groups of Federal law enforcement officials could receive required training in a single, modern training facility designed to meet their individual and collective needs.

The planning group conducted exploratory discussions with many individuals representing relevant aspects of law enforcement training and education. Current literature relating to educational systems and law enforcement training was reviewed.

After this initial investigative period was completed, a "systems approach" to the training problems presented was selected as the most efficient means of developing a framework for the Law Enforcement Training Center.

This approach is oriented toward job needs with an emphasis on what it is that students need to learn to perform a specific task, what facilities best provide a setting for the necessary training, and what instructional methods and media best instruct the student. The focus is on the student and on what he needs to learn. An instructional system design used by the Army Security Agency Training Center and School at Fort Devens, Mass., provided the general framework for the system used in the project (exhibit A).

In this application of a systems approach to a training problem, work began with the examination of the abilities and knowledge required by a skilled law enforcement officer. Experienced agents were contacted first and asked to outline each of the tasks they were required to perform on the job and to describe for each: (1) the conditions under which the task is performed; (2) the frequency of performance of the task; and (3) the degree of proficiency required to satisfactorily perform the task.

These task descriptions were then analyzed and a determination was made as to which could best be learned in a formal training course, through on-the-job training, through assigned reading, or through a combination of these methods. The tasks to be learned in a formal training course were further analyzed and a terminal performance objective was formulated for each task. These objectives describe the behavior the student must be able to demonstrate at the end of the training. They are a measure of student performance under actual job conditions and provide a criterion by which satisfactory performance can be measured.

A typical example of a terminal performance objective is as follows:

> Given a speedgraphic camera and a series of accident scenes and crime scenes under varying conditions of light and locale, the student must be able to take photographs for use as evidence. Eighty percent of the photographs must meet the standards of composition and quality set forth in the Training Guide.

Note how student oriented it is. For comparison, an instructor-oriented class objective is given below:

> Provide the student with a working knowledge of the speedgraphic camera and an understanding of the techniques of photographing evidence material at the scene of an accident or crime during day or nighttime hours.

This paper is not intended to teach the application of a systems approach to curriculum development. It is only the report of one application to a specific subject matter area. The report is intended to explain the steps followed in developing this particular curriculum, to state the problems encountered and their solution, and to provide a general guide for others who wish to use this approach.

However, before attempting to use a systems approach, you are encouraged to review the bibliographical references in appendix I. An understanding of other applications found in the bibliography may help you to determine whether a systems approach is feasible and, if so, how it can be applied most effectively to solve your specific training problems.

II. THE RECRUIT CURRICULUM TASK FORCE

A task force was established to undertake the development of a recruit curriculum. The task force membership included educational specialists (with and without law enforcement experience), law enforcement training specialists, operational law enforcement officials, and an educational psychologist who was experienced in the application of the systems approach in military programs. Each of the participating Federal agencies designated from one to three representatives to work with the task force.

The Federal law enforcement groups to be studied—both police-type and investigative-type units—came from a wide variety of agencies, with differing functions, ranging from the Secret Service to the Border Patrol. The task force began by attempting to discover whether these units had any unique characteristics which would significantly affect the procedures used. Three were found. These were:

A. Size of Groups

The participating groups were small enough and cohesive enough for senior operating officials to be well aware of the details of the jobs as they are currently being performed. This reduced the number of interviews necessary for validation of job descriptions.

B. Duties and Tasks

In each group, such as the U.S. Park Police or the U.S. Secret Service, all new recruits perform essentially the same tasks during the early stages of their employment.

C. Scope

Because of the nature of the jobs involved, a small number of people could research and plan curriculum development from the collection of job analyses to the preparation of training outlines. If a wider variety of jobs had been involved, more documentation and compilation of information would have been necessary and more people would have been required on the task force.

Two of the smaller, but representative, law enforcement groups were then selected for pilot analyses. One was a police-type and the other an investigative-type unit. This pilot effort provided the task force with a development ground to learn the methodology, formulate definitions and formats for describing the needs, and prepare instruments for the collection and documentation of data which could be used in the other law enforcement groups. It also provided a basis for determining the feasibility of the approach, the time and effort required, and a measure of the effectiveness of the systems approach.

III. TASK DESCRIPTIONS

The first step in the systems approach process—the collection of job data with which to build task description—was begun in early January 1968. A worksheet (exhibit C), designed for the documentation of job data, was adapted from materials obtained from the military services. A separate worksheet was prepared for each identifiable task.

Immediate problems were encountered in determining the appropriate level of work to be described as a task. None of the published materials were significantly helpful. In most cases, they provided definitions and examples that would result in the documentation of several thousand elements for each job, far more than could be handled within any reasonable limits of time or cost. On the other hand, the task force was unable to develop a working definition that could be uniformly interpreted and applied. The final procedure used was to break down each indentifiable unit of the job, one level at a time, so long as each breakdown had a definable beginning and end. For example, one of the major police functions is patrolling. Patrol was broken down into such elements as mechanics of patrolling, recognizing violations, making arrests, etc. As the group gained experience, it was found that most could agree on the appropriate level of breakdown for each task. This ability to achieve group consensus, while effective in the long-run, created problems in training the later participants from other agencies in preparing task lists because no clear guidance could be provided.

The task force was divided into two groups: one working on the police agency and the other

on the investigative agency. Each group used a slightly different procedure. The police group developed job data and task descriptions working primarily through interviews. They began with interviews of supervisory officials and worked down through the organization to the point of actually riding with the patrolmen and obtaining first-hand observations of the day-to-day job. The investigative group prepared the initial job data and task descriptions from personal experience, using the agency operating manual as a guide to work areas and to provide leads for the identification of tasks, followed by a spotcheck of a small number of field operating agents for validation.

The police group found that the initial task descriptions developed during the supervisory interviews were reasonably complete and accurate. Some additions or changes were made but very few were really significant.

The investigator group found that relying on operating manuals created problems because a substantial number of administrative processes and operational support requirements were not job tasks, e.g., the requirement for periodic firearms requalification. It, therefore, concluded that interviews of field operating officials on a spotcheck or sampling basis were sufficient to assure a complete, accurate description of the tasks involved in each job.

IV. TASK ANALYSIS

The second step in the process was to determine which tasks should be supported by formal training. An analysis form (exhibit D) provided the means for a systematic task analysis. The analysis was carried out for each task of the police group; however, it was discontinued before being applied to the investigator group. Because the task descriptions themselves made training decisions obvious, no analysis was necessary. (NOTE.—This step would probably be a critical procedure in a large organization or one in which the initial assignments of new employees vary significantly.)

V. FORMULATION OF PERFORMANCE OBJECTIVES

The next step in the process, that of developing a behaviorally stated terminal performance objective (TPO) for each task, proved to be the most difficult, the most significant, and the one most inadequately covered in available published material. Properly formulated, the TPO provides a definitive statement of the behavior the trainee is to demonstrate at the end of the training, the specific conditions under which he is to perform, and the criteria for determining satisfactory performance.

A. Job Task

Initially, an attempt was made to write a separate TPO for each job task (exhibit E). It was quickly found that this was not feasible. Many job tasks, although performed separately, had to be combined with other tasks in the training situation to permit logical instructional patterns. Others had to be broken down into two or more learning objectives while some were broken down and pieces combined with other tasks or parts of tasks. In still other cases, TPO's were necessary to provide knowledge or learning in areas that were not directly related to individual job tasks or were to provide a basis for learning several job tasks. A list of the job tasks, using a short task title, was used for control purposes to assure that all tasks were covered by appropriate training objectives.

B. Performance Objectives

The elements required to state a performance objective adequately are student behavior and conditions and criterion for satisfactory completion. Published materials either included all elements in a single statement or broke them down into separate statements. Both methods presented writing difficulties. The most satisfactory approach to present a clear objective and minimize the duplication and artificiality of wording was found to be a combination of the behavior and conditions in a single statement, with a separate statement of the criterion.

At this point the task force found that a change was required in the sequence of events (see exhibits A and B). It was found in formulating performance objectives that consideration should be given to instructional strategies, course content, and course prerequisites.

After experimentation, a procedure was developed whereby the analyst first examined the job task and made a tentative decision as to the method of teaching to be used, the general type of instructional media applicable, and the type of student or class organization most appropriate for that par-

ticular task. This set the framework for describing the conditions and behavior to be included in the TPO and also established the limits within which the criterion should be developed. (NOTE.—Selection of instructional strategy should be recognized as a necessary step to be considered during the formulation of the TPO's following the sequence set forth in exhibit B.)

(1) Interim Objectives

Interim or enabling objectives are described by many different terms in the training systems literature. Regardless of the term used, they are basically the subordinate or intermediate objectives which, when completed, comprise the total package of knowledge or skill leading to the terminal performance. They were used rather loosely in this project to identify not only the intermediate or component objectives but also to help describe the content of the training and to flag unique items or unusual needs that might not otherwise show up in the training programs. If used precisely as defined, they would lead ultimately to the individual lesson plans.

(2) Limitations

A description of the limitations in the training situation was included in the early TPO's. Later it was discontinued because it was found to be almost always a description of either the impracticality of covering all possible situations in a training program or the inability to create a real-life situation in the classroom, or both. These were found to be universal limitations for which documentation was superfluous. (NOTE.—When this approach is used within an existing program, a description of limitations bearing on the training situation might be significant. Since the current study was undertaken to create a new program, there were no external constraints imposed, such as physical facilities, instructional staff, and funding.)

C. Prerequisites

Prerequisites identify the knowledge and skills the trainee must have to be accepted for entrance into the training program. The task force found it necessary to redefine the concept of prerequisites because the entrance requirements and qualification standards had already been established and were somewhat different for each of the participating agencies. Prerequisites were, therefore, defined as those knowledges and skills to be acquired at the beginning of the training program before the trainee could undertake the instruction leading to a specific TPO.

D. Non-Task-Oriented TPO's

During the process of developing TPO's for the job task descriptions, it became increasingly apparent that a number of areas of knowledge and skill must be acquired by the trainees that were not directly derived from nor related to a job task description. Such areas as the law of search and seizure, rights of individuals, human behavior, crowd psychology, and physical fitness are required in order to perform a number of job tasks. They are learned as separate areas of knowledge or skill which are then combined with other knowledges and skills to perform a specific task. These needs were identified through the identification of prerequisites, as described earlier. The prerequisites that were covered by task-oriented TPO's provided guidance for sequencing courses of instruction. Those that were not covered became the subject on non-task-oriented TPO's.

The non-task-oriented TPO's were even more difficult to write. Here the prevalent traditional use of such broad ambiguous terms as "working knowledge," "familiarization," and "appreciation" seemed almost impossible to avoid at times. Insistence on the use of specific behavioral verbs to describe the objectives and quantitative criteria for measuring satisfactory performance resulted in many rewrites before acceptable material was produced. In many cases, it was difficult, particularly for agency training representatives, to identify specifically what it was the student was expected to acquire as the result of the instruction. For example, a common requirement was described as "a knowledge of the law of search and seizure." Translation of this need into a description of what specific knowledge was to be acquired and how the instructor would measure the extent of the student's acquisition of that knowledge was a difficult exercise. However, the final product was a very specific statement of what should be learned and how the extent of learning would be measured:

Terminal performance objective

Given a series of situations requiring application of the law of search and seizure, be able to identify the requirements and limitations for a legal search and seizure.

Criterion

In an examination based on the given situations in Training Guide ______, must:

1. In ____ of the total situations, correctly determine whether probable cause exists.
2. In ____ of the pertinent situations, correctly determine whether a warrant is necessary.
3. In ____ of the total situations, correctly identify the legal requirements and limitations with respect to searching.
4. With respect to seizing various items, correctly identify those which may be seized legally (____ percent accuracy required).

VI. TRAINING OUTLINES

The final step in the process was the development of training course outlines identifying, for each unit of instruction, the TPO content in terms of interim objectives, instructional methods, instructional media, and the required time for the instruction, including reading and testing time (exhibit F). (NOTE.—This final step enabled other task groups to develop organizational and staffing plans, financial systems, facilities and equipment plans, and cost estimates for the Consolidated Federal Law Enforcement Training Center.)

Development of training outlines involves three areas of judgment and decision: specific course content, teaching methods and media, and instructional time. Since the task force found little information available on law enforcement training, it was forced to rely on the experience and judgment of its membership. The task force found that the sequence of events described in the training systems literature could not be literally followed. In this application, it appeared more appropriate to review and refine the instructional methods, revise and rearrange the TPO's, and develop initial course content descriptions and training times all in a single exercise rather than one at a time.

As a guide in the final selection of instructional strategies (media and methods columns on training outlines of exhibit F) a procedure (exhibit G) was followed using a guide (exhibit H) to determine the most appropriate strategies for each terminal performance objective. After the training outlines were completed on the basis of the most experienced judgment available, they were compared individually with the guide (exhibit H). Where differences were noted from the methods and media in the guide, the decisions were reviewed to assure that all pertinent factors were considered before a final determination was made and recorded.

(NOTE.—The final task force product—a curriculum for training Federal law enforcement recruits—will, of course, need to be reworked, revised, and updated as new information and experience is gained.)

EXHIBIT A

INSTRUCTIONAL SYSTEM DESIGN DIAGRAM

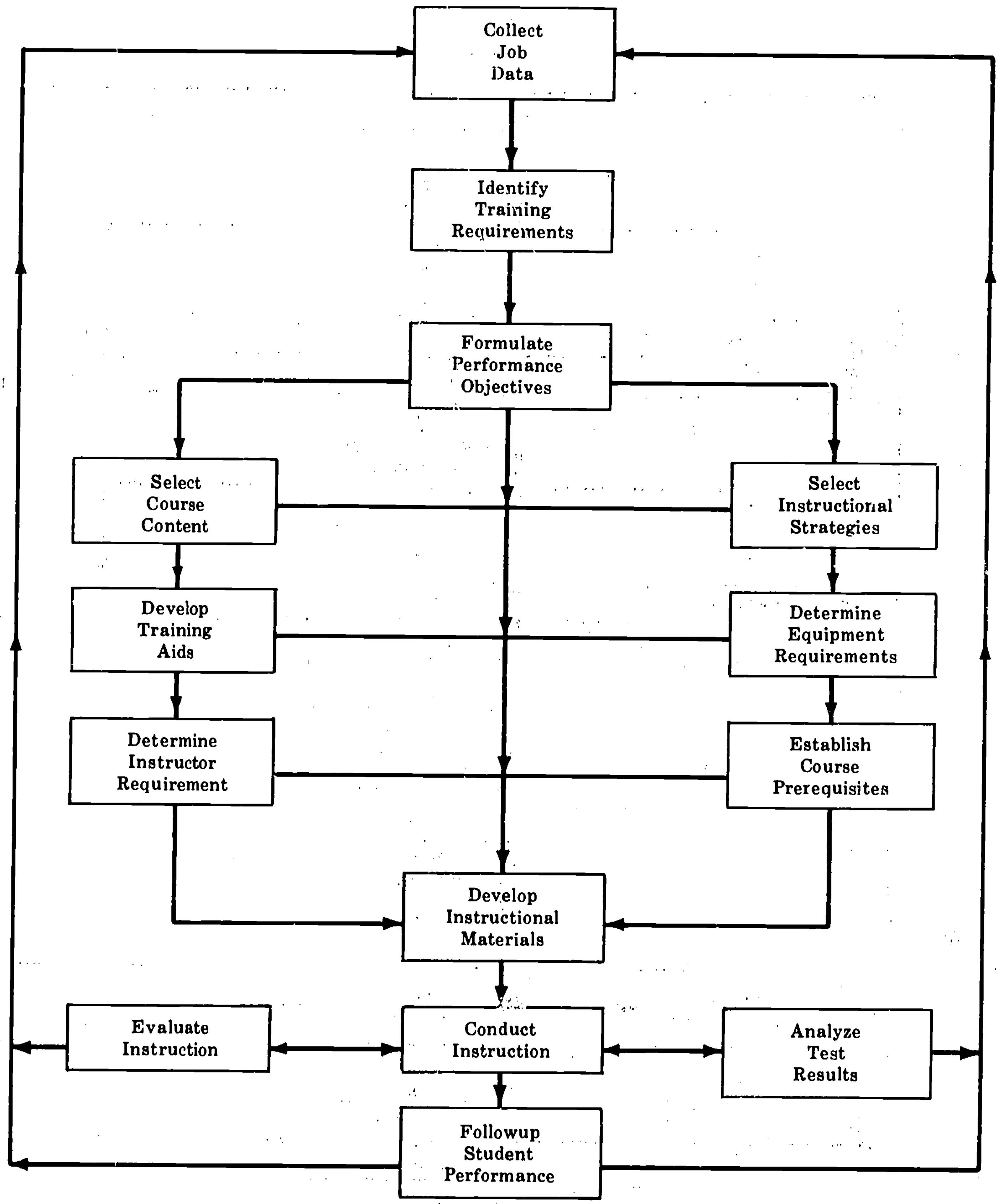

EXHIBIT B

INSTRUCTIONAL SYSTEM DESIGN DIAGRAM
(Revised)

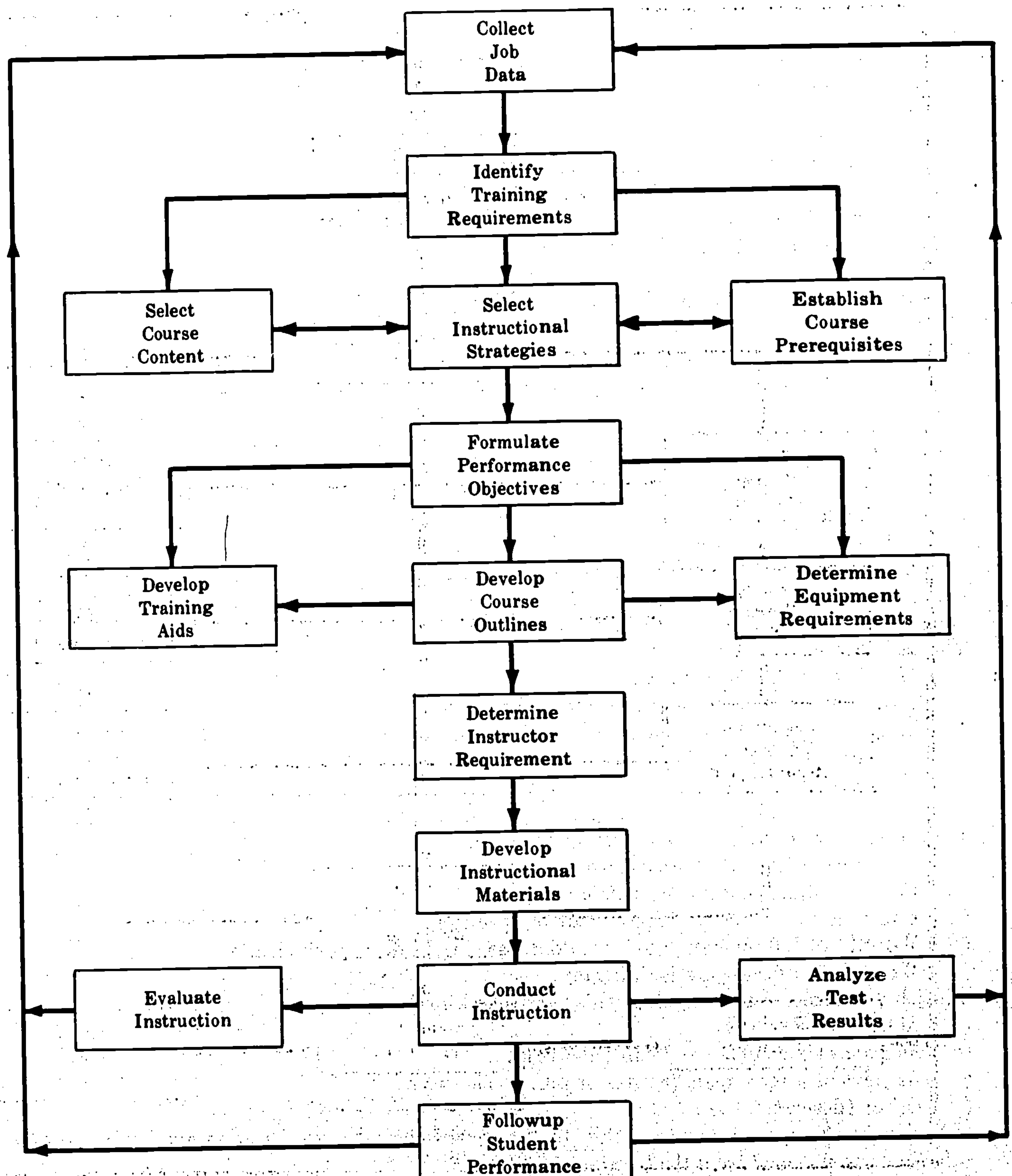

EXHIBIT C

TASK DATA DESCRIPTION

Date: ______________________

Task number (number each task consecutively) ______________________

Task title (describe or name the task)______________________

Organization being analyzed ______________________

Source of information (check one)

( ) Personal experience.

( ) Job description (check one of the three below):

( ) Formally written by job performer or his predecessor.

( ) Derived by observation or survey by task analyzer on site.

( ) Derived from the mission statement by task analyzer.

( ) Supervisor.

( ) Other sources that have previously collected this data.

Task description

1. What does the man do? ______________________

____

____

____

2. What are the limiting pressures on this behavior?

( ) Time. ( ) Precision. ( ) Sequence of performance. ( ) Location. ( ) Bystander reaction.

( ) Other factors (specify): ______________________

3. How is performance of the task currently evaluated? ______________________

____

Conditions under which task is accomplished

1. This task occurs (check one):

( ) More often than once daily.

( ) Less than once daily, but more often than once weekly.

( ) Less than once weekly, but more often than once monthly.

( ) Less than once monthly.

( ) Variable (describe): ______________________

____

2. If the task were not learned, its lack (check one):

( ) Could cause death or serious injury.

( ) Could seriously damage operation.

( ) Could cause temporary impairment of operation.

( ) Would not halt operation but would cause it to be done inefficiently.

( ) Would not affect operation notably.

3. The job performer commonly does this task (check one):

( ) Alone.

( ) As part of a 2- to 5-man team (identify).

( ) As part of a large team (6 men or more) (identify).

( ) Other (describe).

(Identify in the space below the other task team members by organization and level; example, the other man is an agent from the Border Patrol.)______________________

4. The time in which the task is usually performed is (check all appropriate boxes):
   ( ) Morning. ( ) Afternoon. ( ) Night. ( ) No particular time of day.
5. Check one and complete:
   ( ) When the task is performed, it generally requires ____ minutes to complete.
   ( ) The task has no clear cut beginning and end.
6. To accomplish this task, the job performer has available (check applicable boxes):
   ( ) No direct personal supervision.
   ( ) A little direct personal supervision.
   ( ) More supervision than not.
   ( ) Complete supervision.
   ( ) Use of reference materials, forms, lists, aids, or manuals (describe). ____________________
   ( ) No on-the-site use of reference materials, forms, lists, aids, or manuals.
7. The man is expected to perform this task (check one):
   ( ) Immediately upon assignment following completion of the course.
   ( ) Some time within 30 days following completion of the course.
   ( ) Between 30–(120 days following completion of the course.
   ( ) Not until he has 4 months or more of experience on the job.
8. Other conditions that may have a bearing on the task (identify in the space below):

____

____

____

Name of Task Analyzer ____________________

EXHIBIT D

TASK ANALYSIS FORM FOR THE CURRICULUM

Date: ____________________

1. Task Number ____________________ 2. Organization ____________________
3. Task Title ____________________
4. Task Priority (Use Priority Planning Sheet to determine number.) ____________________
5. Required Pretraining Skills and Knowledges for This Task (list and describe in brief):

   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________
   5. ____________________
   6. ____________________

(Continue on additional paper as needed)

6. Performance Constraints (include if remedial training is to be offered and subject area(s) of such training):

   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________

7. Type of Task (check those applicable):

   ( ) Specific example (has an observable beginning and end; generally completed in a short time).
   ( ) Procedural or sequential (must be done step-by-step in a definite way).
   ( ) Nonsequential (can be done any number of ways).
   ( ) Continuous (has no observable beginning or end; is not an end in itself but is a means towards some end).
   ( ) Generalizable behavior (uses a principle or set of principles from which a problem solution is drawn and applied to the particular task).

8. Required Support for This Task (specify the things, practices, people and estimated time needed to accomplish the task):

   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________
   5. ____________________
   6. ____________________
   7. ____________________
   8. ____________________
   9. ____________________
   10. ____________________

(Continue on additional paper as needed)

9. Performance Interrelations (specify to what other tasks this task relates, associates or discriminates):
   1. ______
   2. ______
   3. ______
10. Administrative Limits (list the factors in school operation and administration that restrict the terminal behavior's complete accomplishment):
   1. ______
   2. ______
   3. ______
   4. ______
11. Design limits (list the elements within the curriculum design that limit complete attainment of the task behavior):
   1. ______
   2. ______
   3. ______
   4. ______
12. Decision (check one):
   ( ) The behavior should be taught entirely in a basic formal course.
   ( ) The behavior should be taught formally, in part, in a basic course and partially on the job. Specify those parts that should be taught on the job:

   ______
   ______
   ______
   ______

   ( ) The behavior should be taught entirely on the job.
   ( ) The behavior should be taught as an intermediate or advanced course.

EXHIBIT D (2)

CONVERSION SCALE

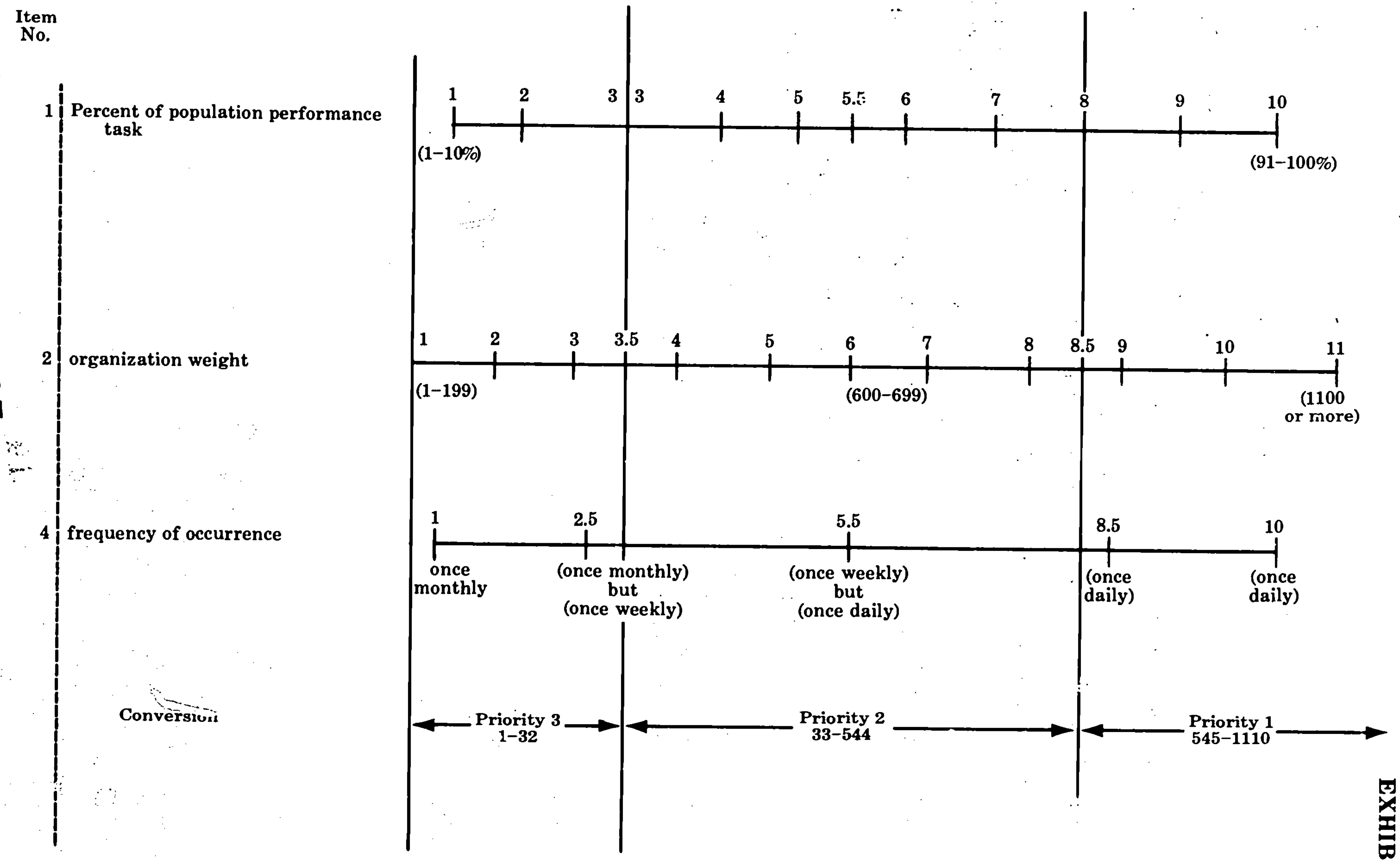

EXHIBIT D (3)

PRIORITY PLANNING SHEET

If Task Data Description indicates lack of skill could cause death or serious injury (Priority No. 1) or could seriously damage the operation (Priority No. 2), enter priority number in item 4, Task Analysis Form, and eliminate the following computation.

	Value	Range low	Range high
1. Percent of law enforcement population performing task	______	1	10
		(Deciles.)	
2. Organization weight (total number of trainees is 1,100)	______	1	11
		(Number trainees per 100 to nearest whole number.)	
3. 1 x 2	______	1	110
4. Frequency of occurrence	______	1	10
		(---- monthly to daily.)	
5. 3 x 4	______	1	1, 110

Conversion Scale (see next page for graphic representation)

Scale Value (Item 5 above)	*Priority (enter in item 4, Task Analysis Form)*
1–32	3 (lowest)
33–544	2
545–1, 100	1 (highest)

EXHIBIT E

TPO FORMAT

Job Task

Brief title of the job-related task, if any.

Terminal Performance Objective

Description of the behavior required of the trainee upon completion of training and the conditions under which the behavior is to be performed. Use action verbs to describe the behavior.

Criterion

Description of the specific measures to be used in determining whether the terminal behavior is acceptable.

Limitations

Note any special or unusual limitation to be considered in developing the training materials.

Prerequisites

Identify the previous training required for the trainee to enter the course. Do not list job entrance qualifications.

Interim Objectives

List the subordinate or intermediate objectives which lead the trainee from the prerequisite level to the terminal performance objective.

EXHIBIT F

TRAINING OUTLINE

Unit: ______________________ Time: __________ Date: __________
Number of Students: ______

Terminal performance objective	Interim objective	References and explanation	Media	Methods	Reacting	Time		
						Class	P.E.	Testing

EXHIBIT G

SELECTION OF INSTRUCTIONAL STRATEGIES

PROCEDURE

1. For each terminal performance objective (shown in 1st col. of exhibit F) compare the behavior described in that objective with the items (*a* through *u*) listed under 1. Training objectives of the guide (exhibit H). Select the items which most nearly describe the training objectives to be achieved and note the item letter.

2. Examine the items (*a* through *l*) listed under 2. Content of the guide (exhibit H) and select the item which best describes the content of learning required to achieve the desired behavior and note the item letter.

3. Examine the items (*a* through *i*) listed under 3. Trainee population of the guide (exhibit H) and select the characteristics which apply to the particular group or groups of trainees involved in the program.

4. Examine the items (*a* through *i*) listed under 4. Other of the guide (exhibit H) and select the factors which should be considered in selecting the appropriate strategy. More than one item may be applicable. Note the item letters which apply.

5. Review the strategies selected for each of the four areas listed under criteria in the first column of guide (exhibit H). Determine the most appropriate strategies and record them on the training outline (exhibit F) under the media and methods columns.

6. The guide (exhibit H) is intended primarily to assist in the selection of instructional strategies. Additions may be made to the guide to meet agency training requirements.

EXHIBIT H

GUIDE

Criteria (1)	Strategies: Primary method (2)	Strategies: Support method (3)	Strategies: Mediating device (4)
1. Training objectives:			
a. To orient studies to policies, rules, course purposes, learning resources, or the like.	L	C	SRS
b. To introduce a subject, indicate its importance and present an overview of its scope.	L	C	SRS
c. To give directions to students on procedures to use in subsequent learning activities.	L	C	SRS
d. To illustrate the application of rules, principles, or procedures	D	PE	
e. To build required common background for in-class study or a subject (advance study).	PI	C	TM
f. To provide review of content or practice of skills taught in class (homework)	PI	PE	TM
g. To provide a pattern for later performance and to set standards for that practice.	D	PE	SRS
h. To teach manual or manipulative operations including the use of tools and test equipment, assembly, disassembly, or repair of equipment.	PE	D	
i. To teach principles or theories (why something works)	PI	PE	TM
j. To teach operation and function of equipment (how something works)	PI	PE	TM
k. To teach the execution of tactical movements or team skills	PE	D	
l. To teach use or control of the voice, balance, breath, or muscles	PE	D	
m. To stimulate student interest and thinking through group participation	C	----------	
n. To make use of students' past experience in collecting facts and ideas for the solution of a problem.	C	SA	
o. To teach safety procedures	D	PE	CCTV
p. To improve reasoning and problem-solving abilities	C	SA	
q. To illustrate the application of concepts and principles	D	C	SRS
r. To provide for maintenance of a skill	PE	----------	
s. To review, clarify, emphasize, or summarize material	L	C	SRS
t. To evaluate learning	PE	C	SRS
u. To control learning conditions for experimental purposes	PI	PE	TM
2. Content:			
a. Deals mainly with concepts and principles	PI	C	TM
b. Deals mainly with reasoning and problem solving	C	SA	
c. Deals mainly with manual or manipulative operations	PE	D	
d. Requires intensive individual practice	PE	D	
e. Deals with materials which require visual or auditory illustration	L	D	SRS
f. Requires control over performance to prevent the practice of errors	PE	D	
g. Involves hazard to men or equipment	D	PE	CCTV
h. Requires absolute control over the sequence of presentation	PI	PE	TM
i. Demands absolute control over the form of the student's response	PI	PE	TM
j. Lends itself to oral presentation	L	D,C	SRS
k. Is relatively stable	PI	PE	TM
l. Is subject to frequent and radical change	L	D	SRS

Criteria (1)	Strategies: Primary method (2)	Support method (3)	Mediating device (4)
3. Trainee population:			
a. Is relatively homogeneous in terms of aptitude, ability, speed of learning, prior training, or experience.	L	D	SRS
b. Has wide differences in aptitude, ability, speed of learning, prior training, or experience.	PI	PE	TM
c. Is mature enough and sufficiently motivated to work more or less independently.	PI	PE	TM
d. Has the level of reading ability required to deal with the instructional material	PI	----------	TM
e. Is relatively large in numbers	PI	----------	TM
f. Is relatively small in numbers	D	PE	
	C	----------	
	PE	----------	
g. Has experiences, backgrounds, or prior training which are germane to the content.	C	----------	
h. Has sufficient skill to put opinions, ideas, and experiences into words	C	----------	
i. Has been prepared for the instruction by reading, lecture, or demonstration	PE	----------	
4 Other:			
a. Individual and continuous student progress is essential	PI	PE	TM
b. Active student responses is critical to learning	PI	PE	TM
	PE	----------	
c. Active student response is not critical to learning	L	D	
	D	----------	
d. Standardization of instruction is critical	PI	PE	TM
e. Standardization of instruction is not desired	COM	----------	
f. Mastery of a skill is critical	PE	----------	
g. An accurate record of student responses is needed	PI	PE	TM
	PI	PE	CBIS
h. Immediate correction of errors is critical	PI	PE	TM/SRS
	PI	PE	CBIS
	PE	----------	
i. Problems of integration with other instructional strategies are not critical	PI	PE	TM
	PI	PE	CBIS
	PE	----------	

Key:
L —Lecture and AV.
C —Conference.
D —Demonstration.
PE —Practical exercise.
PI —Programed instruction.
SA —Study assignment.
T —Tutoring.
COM —Combination instruction.
TM —Teaching machines.
SRS —Student response system.
CBIS —Compnter-based instructional system.
CCTV—Closed-circuit television.

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☆U.S. GOVERNMENT PRINTING OFFICE: 1969 O 350-190